

Nashville, Tennessee.—A violent storm prevailed at this place during the evening of the 28th. Considerable damage was done to buildings throughout the city and many valuable shade trees were blown down.

Indianapolis, Indiana, 29th.—A violent storm occurred at Columbus, Bartholomew county, between 1 and 2 a. m., of this date, during which a number of buildings were unroofed.

Waterproof, Tensas parish, Louisiana.—A severe storm passed over the Tensas river at 3 a. m. of the 29th. The buildings on a number of plantations were blown down and several persons were injured.

Lexington, Kentucky.—A severe storm passed through Bourbon county at 2 a. m. the 29th, cutting a path through a dense forest for a distance of six miles. Fencing, barns and buildings were blown down. Three persons were buried beneath the ruins of one building, two of whom were killed. A second storm occurred at Paris, in this county, which unroofed a number of buildings and caused damage estimated at from \$25,000 to \$30,000. The roofs of three warehouses near the North Carolina freight depot were carried a distance of several hundred yards.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the following table are shown the danger points at various river stations; the highest and lowest stages for October, 1883, with the dates of occurrence; and the monthly ranges. No high stages of water have occurred in any of the rivers. In the Ohio river and at stations on the Mississippi, south of Saint Louis, the highest water was recorded at the close of the month. The greatest range occurring during the month, eleven feet and eleven inches, was noted in the Ohio river at Cincinnati. In the upper Missouri and upper Mississippi rivers the monthly ranges have been less than twelve inches:

Heights of rivers above low-water mark, October, 1883.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>	<i>Ft. In.</i>		<i>Ft. In.</i>		<i>Ft. In.</i>	<i>Ft. In.</i>
Shreveport, Louisiana.....	29 9					
<i>Arkansas:</i>						
Little Rock, Arkansas.....	30 0	23	13 6	9 to 13	3 0	10 6
Fort Smith, Arkansas.....		20, 21	6 0	3, 4	3 0	3 0
<i>Missouri:</i>						
Yankton, Dakota.....	20 0	25 to 28, 30	1 2	10 to 17	0 10	0 4
Omaha, Nebraska.....	16 0	11	5 7	3, 4, 5	4 10	0 9
Leavenworth, Kansas.....	21 0	30	7 7	16	5 10	1 9
<i>Mississippi:</i>						
Saint Paul, Minnesota.....	14 6	22, 29, 30	2 6	4 to 7, 14, 21	1 10	0 8
La Crosse, Wisconsin.....	18 0	21	2 1	10	1 4	0 9
Dubuque, Iowa.....	21 10	2	4 10	12, 13, 14	3 10	1 0
Davenport, Iowa.....	15 0	3, 4, 20, 31	3 1	12, 16, 17	2 7	0 6
Keokuk, Iowa.....	14 6	6, 27, 28, 29	3 5	1	2 10	0 7
Saint Louis, Missouri.....	30 0	31	11 7	1	7 1	4 6
Cairo, Illinois.....	40 0	31	11 6	1	4 9	6 9
Memphis, Tennessee.....	34 0	31	7 0	1	2 3	4 9
Vicksburg, Mississippi.....	41 0	30, 31	11 7	5, 6	2 11	8 8
New Orleans, Louisiana †.....	—2 6	28	—12 2	8, 9, 10, 17	—13 8	1 6
<i>Ohio:</i>						
Pittsburg, Pennsylvania.....	20 0	31	10 1	19, 20, 21	0 9	9 4
Cincinnati, Ohio.....	50 0	31	17 6	27	5 7	11 11
Louisville, Kentucky.....	24 0	31	8 6	1	3 11	4 7
<i>Cumberland:</i>						
Nashville, Tennessee.....	42 0	30	9 3	1, 2, 3	0 10	8 5
<i>Tennessee:</i>						
Chattanooga, Tennessee.....	33 0	9	6 1	20 to 23	0 11	5 2
<i>Monongahela:</i>						
Pittsburg, Pennsylvania.....	29 0	31	10 1	19, 20, 21	0 9	9 4
<i>Savannah:</i>						
Augusta, Georgia.....		24	8 4	14 to 22, 24	4 2	4 2
<i>Willamette:</i>						
Portland, Oregon.....		1, 2	2 10	25	0 5	2 5
<i>Sacramento:</i>						
Red Bluff, California.....		27	1 10	8, 24	0 6	1 4
Sacramento, California.....		28	8 4	1	6 9	1 7
<i>Mobile:</i>						
Mobile, Alabama.....		2, 18	17 8	6	15 0	2 8
<i>Colorado:</i>						
Yuma, Arizona.....		30	15 4	13, 14, 15, 18	14 2	1 2

† Below high-water mark of 1874 and 1883.

FLOODS.

Lead Hill, Boone county, Arkansas.—During the 8th and 9th more than five inches of rain fell at this place which caused the creeks in this vicinity to overflow. The farmers sustained heavy losses by having their fencing and unharvested crops swept away. On the morning of the 18th, Crooked creek, which flows through Boone and Marion counties, overflowed its banks, causing great damage to the crops on the adjacent farms. The streets in the town of Harrison, Boone county, were flooded and several houses were washed away. The water in Sugarloaf creek rose to a height seven feet higher than was ever before known. The crops on many farms on this creek were almost totally ruined, while the farms on the smaller streams suffered serious losses. More than four inches of rain fell at Lead Hill during the 18th and 19th.

Little Rock, Arkansas.—Reports from Bateville, Independence county, on the 21st, stated that at least 12,000 acres of corn and cotton lands in the White river valley in Independence county were inundated by the overflow, caused by the recent heavy rains. Very great damage was sustained by the small farms on White river and a large number of persons lost almost their entire possessions by the flood. This rise in the White river at this season of the year is unprecedented.

Key West, Florida, 21st.—Many houses in the eastern part of this city and all of the streets were flooded by the very heavy rain of this date. In some dwellings the water covered the floors to depths of from one to four feet and caused much damage. Numerous families were compelled to abandon their homes and to move their furniture, &c., in boats. The total rainfall for the 21st, was 9.23 inches, which is the heaviest precipitation ever known at this place.

Vincennes, Knox county, Indiana.—A heavy wind and rain storm passed over this vicinity during the afternoon and night of the 28th. The rain fell in torrents causing great damage on the farms in this section. Several cellars in this city were filled with water. The Wabash river rose rapidly at this place.

Terre Haute, Vigo county, Indiana, 29th.—The heavy rains of the past few days caused the Wabash river to rise seven feet on this date. The sudden rises in the smaller streams in this vicinity caused slight washouts on the Indianapolis, Saint Louis, and Vandalia railroads.

HIGH TIDES.

New London, Connecticut, 2d.
Savannah, Georgia, 18th.
Cape Lookout, North Carolina, 10th, 11th, 16th to 20th, 24th, 25th.
Fort Macon, North Carolina, 18th, 19th, 20th,
New River Inlet, North Carolina, 28th, 29th.
Portsmouth, North Carolina, 8th, 10th, 15th, 16th, 17th.
Sloop Point, North Carolina, 6th.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for October, 1883, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 90.14 per cent. The percentages for the four elements are: weather, 89.41; direction of the wind, 89.88; temperature, 91.34; barometer, 89.98 per cent. By geographical districts they are: For New England, 89.52; middle Atlantic states, 90.63; south Atlantic states, 89.77; eastern Gulf, 90.80; western Gulf, 90.23; lower lakes, 89.69; upper lakes, 91.67; Ohio valley and Tennessee, 89.62; upper Mississippi valley, 92.09; Missouri valley, 87.70; north Pacific, 75.00; middle Pacific, 93.00; south Pacific, 96.59.

There were forty-five omissions to predict out of 3,813, or 1.18 per cent. Of the 3,768 predictions that have been made, sixty-one, or 1.62 per cent., are considered to have entirely failed; fifty-six, or 1.49 per cent., were one-fourth verified; three hundred and sixteen, or 8.39 per cent. were one-half verified; four-

hundred and forty-two, or 11.73 per cent., were three-fourths verified; 2,893, or 76.78 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During October, 1883, two hundred and fifty-one cautionary signals were displayed. Of these, one hundred and eighty-one, or 72.1 per cent., were justified by winds of twenty-five miles, or more, per hour, at or within one hundred miles of the station. Forty-nine cautionary off-shore signals were displayed, of which number, thirty-nine, or 79.6 per cent., were fully justified. Of the ten off-shore signals which were not fully justified, seven were justified as to direction only, two were justified as to velocity only, and one was not justified either as to direction or velocity. Twelve "northwest" signals (displayed on the lakes) were ordered, all of which were justified as to direction, and nine, or 75.0 per cent., were justified both as to direction and velocity. Three hundred and twelve signals of all kinds were displayed, of which two hundred and twenty-nine, or 73.4 per cent., were fully justified. These do not include signals ordered at display stations, where the velocity is only estimated. Eleven signals were ordered late.

Sixty-six winds of twenty-five miles, or more, per hour were reported, for which no signals were ordered. Many of these were high local winds or strong sea-breezes.

TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors at the Signal Service stations, during October, 1883, with the average depth at which the observations were made, are given in the table below. The highest water temperature observed during the month, 89°, occurred at Charleston, South Carolina, on the 1st; the lowest, 41° 5, occurred at Marquette, Michigan, on the 26th, 27th, and 29th. The largest monthly ranges are: 21° at Charleston, South Carolina; 18° at Cedar Keys, Florida; 17° 8 at Chincoteague, Virginia; 17° 6 at Fort Macon, North Carolina; 17° at Augusta, Georgia. The smallest monthly ranges are: 2° 9 at Eastport, Maine; 3° 4 at San Francisco, California, and 5° 3 at Duluth, Minnesota.

Temperature of Water for October, 1883.

STATION.	Temperature at bottom.		Range.	Average depth, feet and inches.	Mean temperature of the air at station.
	Max.	Min.			
Atlantic City, New Jersey.....	64.9	52.6	12.3	3 8	55.5
Alpena, Michigan.....	49.1	39.8	9.3	12 0	42.7
Augusta, Georgia.....	80.0	63.0	17.0	4 9	68.2
Baltimore, Maryland.....	66.5	57.0	9.5	10 0	57.5
Block Island, Rhode Island.....	61.5	51.3	10.2	8 7	52.4
Boston, Massachusetts.....	58.2	47.5	10.7	22 7	47.4
Buffalo, New York.....	58.8	51.3	7.5	10 2	48.4
Cedar Keys, Florida.....	87.4	69.4	18.0	11 9	76.3
Charleston, South Carolina.....	89.1	68.1	21.0	41 5	69.0
Chicago, Illinois.....	59.7	47.8	11.9	8 5	51.5
Chincoteague, Virginia.....	72.8	55.0	17.8	6 4	58.6
Cleveland, Ohio.....	60.3	50.0	10.3	14 0	51.6
Detroit, Michigan.....	59.6	47.0	12.6	22 8	50.8
Delaware Breakwater, Delaware.....	67.4	55.5	11.9	8 7	58.2
Duluth, Minnesota.....	50.7	45.4	5.3	15 6	44.1
Eastport, Maine.....	50.1	47.2	2.9	16 9	44.7
Escanaba, Michigan.....	77.6	60.0	17.6	5 3	65.2
Fort Macon, North Carolina.....	84.0	70.0	14.0	11 2	76.9
Galveston, Texas.....	57.9	45.8	12.1	19 0	47.6
Grand Haven, Michigan.....	83.0	60.5	6.5	8 9	76.8
Indianola, Texas.....	84.0	73.0	11.0	18 0	74.2
Jacksonville, Florida.....	87.0	79.0	8.0	17 8	79.5
Key West, Florida.....	54.6	46.9	7.7	10 0	44.7
Mackinaw City, Michigan.....	50.0	41.5	8.5	9 10	43.0
Marquette, Michigan.....	58.5	46.0	12.5	8 0	48.8
Milwaukee, Wisconsin.....	84.0	72.0	12.0	16 4	73.3
Mobile, Alabama.....	62.2	48.2	14.0	15 3	49.0
New Haven, Connecticut.....	63.0	52.0	11.0	13 4	50.9
New London, Connecticut.....	62.6	53.5	9.1	16 9	53.7
Norfolk, Virginia.....	71.3	57.8	13.5	18 4	62.2
Pensacola, Florida.....	83.6	71.4	12.2	17 2	72.2
Portland, Maine.....	54.5	47.0	7.5	17 11	48.2
Portland, Oregon.....	56.7	50.0	6.7	54 8	50.8
Provincetown, Massachusetts.....	61.0	48.0	13.0	11 10	50.1
Sandusky, Ohio.....	59.5	46.3	13.2	10 10	52.5
Sandy Hook, New Jersey.....	63.0	50.2	6.8	1 8	55.2
San Francisco, California.....	59.5	56.1	3.4	39 10	57.1
Savannah, Georgia.....	81.3	66.2	14.6	12 6	70.0
Smithville, North Carolina.....	79.2	64.2	15.0	10 0	65.7
Toledo, Ohio.....	59.5	46.6	12.9	11 10	51.8
Wilmington, North Carolina.....	72.8	63.5	9.3	21 0	66.0

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroral displays were observed during October as follows:

1st.—Johnson, Nebraska.

4th.—Gardiner, Maine.

5th.—This was the most brilliant display of the month; it was reported by the following stations: Block Island and Point Judith, Rhode Island; New Haven, Connecticut; Fall River, Taunton and Cambridge, Massachusetts; Eastport, Cornish and Gardiner, Maine; Newport, Vermont; Ithaca and Oswego, New York; Alexandria, Dakota.

6th.—Mount Washington, New Hampshire; Point Judith, Rhode Island; Gardiner Maine.

7th.—Johnson, Nebraska.

14th.—At Charleston, South Carolina, an aurora was reported to have been seen between 4 and 5 a. m., on the northern horizon. It resembled the electric light and was of sufficient intensity to show a bright radiance on the sides of the buildings.

15th.—Alpena, Michigan; Northfield, Minnesota.

16th.—Provincetown, Massachusetts; Mackinaw City and Escanaba, Michigan; Washington, District of Columbia.

18th.—Escanaba, Michigan.

19th.—Duluth, Minnesota.

24th.—Haverford College, Pennsylvania.

26th.—Mount Washington, New Hampshire.

ATMOSPHERIC ELECTRICITY INTERRUPTING TELEGRAPHIC COMMUNICATION.

Logansport, Indiana, 8th.—Telegraphic communication was interrupted by atmospheric electricity on this date.

Fort Buford, Dakota.—A snow storm, which began at 8.45 p. m. of the 30th, was preceded by an electrical disturbance, which rendered telegraphic communication almost impossible. At times the electric current was so strong as to make it very difficult to adjust the instruments. When the snow began falling the current assumed its normal condition.

THUNDER-STORMS.

Thunder-storms were reported in the various districts on the following dates:

New England.—2d, 10th, 12th, 13th, 14th, 29th, 30th, 31st.

Middle Atlantic states.—1st, 2d, 10th, 13th, 14th, 23d, 29th.

South Atlantic states.—1st to 4th, 6th, 14th, 15th, 16th, 21st, 28th, 29th, 30th.

Florida peninsula.—4th to 7th, 13th, 15th to 19th, 21st, 22d, 29th, 30th.

Eastern Gulf.—1st, 2d, 9th, 13th, 14th, 16th, 18th to 22d, 28th, 29th.

Western Gulf.—1st, 2d, 3d, 5th, 6th, 9th to 22d, 24th, 26th to 29th.

Tennessee.—1st, 2d, 3d, 5th, 6th, 10th, 11th, 16th, 18th, 27th, 28th, 29th.

Ohio valley.—1st, 2d, 4th, 5th, 6th, 9th, 10th, 11th, 13th, 27th, 28th, 29th.

Lower lakes.—2d, 9th, 10th, 12th, 13th, 19th, 29th, 30th.

Upper lakes.—1st, 5th to 10th, 17th, 28th, 29th.

Upper Mississippi valley.—1st, 2d, 4th to 11th, 17th, 18th, 19th, 27th, 28th, 29th.

Missouri valley.—1st to 13th, 16th to 19th, 26th, 28th, 29th.

Middle slope.—1st, 7th, 12th, 16th, 17th, 20th, 22d, 27th, 28th.

Southern slope.—1st to 6th, 8th to 12th, 16th, 17th, 22d, 27th.

Southern plateau.—2d, 6th to 11th, 15th, 16th, 29th 30th.

Thunder-storms were also reported from the following stations not included in the districts named above:

Princeton, California, 1st, 7th.

Salt Lake City, Utah, 4th.

Sacramento, California, 5th.

Moorhead, Minnesota, 5th, 7th.

Fort Meade, Dakota, 7th.

North Platte, Nebraska, 7th.

Rio Grande City, Texas, 13th, 19th, 20th, 21st, 24th.